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ECONOMIC

PROPOSAL TO IMPORT ALASKAN CRUDE OIL DISCUSSED

Tokyo SENTAKU in Japanese Feb 82 pp 72-75

[Text] As a last resort to eliminate the U.S.-Japan economic frictions that are intensifying daily, a scheme to import Alaskan crude oil has rapidly surfaced. It is a grand scheme for Japan to import the crude oil produced in the North Slope of Alaska and to structurally change the U.S.-Japan trade imbalance.

With the U.S. Cabinet's decision in November of last year to continue the policy to ban crude oil exports, it appeared temporarily as though that realization might be remote. Subsequently, however, voices to lift the ban have become stronger in the United States, and the government Liberal Democratic Party has decided there is "hope for success," and plans to propose the project positively.

Minister Abe of MITI, who attended the tripartite conference of Japan and Euro-American countries held on 15 and 16 January, brought up the subject of Alaska crude oil in unofficial talks with the United States. Also, in talks with President Reagan on the 18th, he directly requested the "export of Alaskan crude oil" to Japan. As of the end of January, no guesswork is possible, but the situation has shifted so that the weight of the biggest issue of 1982, U.S.-Japan economic friction, may be influenced by the handling of Alaskan crude oil.

It is said that the briefcase carried by MITI Minister Abe in his U.S. visit contained only the data required to appeal for continued free trade from the global point of view, and as specific measures, a 2-year retroactive tariff reduction based on the Tokyo Rounds and readjustment and rationalization of nontariff barriers. However, these were merely the framework, and what was hidden at the bottom of the minister's briefcase was in fact the Alaskan crude oil issue. The truth is that the Alaskan crude oil issue was flung in as a concrete measure to radically change the trade structure, since the effect of merely opening Japanese markets will literally be "water on the burning rock" of the U.S.-Japan trade imbalance that is about to reach \$20 billion. U.S. Trade Representative Brock is reported to have stated: "It is difficult because of the marine transportation problems in the United States, but it may be possible in the future if Alaskan crude production increases. However, it will be a year or more from now." Within the government Liberal Democratic Party, the expectation of importing Alaskan crude is mounting, and the substance of the "Abe negotiation" will be revealed in the near future and will probably surface as a specific political issue.

Improvement of Balance by \$5 Billion a Year

The scale of the Alaskan crude importation scheme is indeed a grand one. The scheme is for Japan to import approximately one-third of the crude oil being produced in Alaska, which has one of the world's biggest oilfields, and improve the trade balance by about \$5 billion a year all at once. With respect to the scale, it may be said that it is an unprecedented project in the history of U.S.-Japan trade.

This grand scheme was first considered at the so-called "U.S.-Japan Council of Wisemen." This council was established on the basis of a U.S.-Japan summit meeting between the late Prime Minister Ohira and former President Carter. Four members represent each side, with the Japanese party led by N. Ushiba, former minister for external affairs, and the U.S. party by Robert S. Ingersoll, former deputy secretary of state. It has been continued in the Reagan administration; "the first report" was published in January and "the second report" in October 1981, respectively.

The Alaskan crude issue is discussed in these two reports. The first report says: "It is possible at present to supply Alaskan crude oil to the U.S. West Coast in volume that exceeds regional refining capability, but there is no efficient means of transporting it to the East Coast region or the central part of the continent. According to U.S. law and policy, exports of Alaskan crude oil are prohibited to various foreign countries where it can be economically transported--for example, Japan." Then, in a strong tone, it states: "We recommend the amendment of the U.S. oil export policy so that Alaskan crude oil can be sold to Japan on the condition that Japan sells to (or swaps with) the United States the crude oil it planned to import."

Although the statements are difficult to understand because of the circuitous language characteristic of "diplomatic documents," the following is a rough "translation" of excerpts related to Alaskan crude oil:

The crude oil being produced from the big oil field in the North Slope district of Alaska amounts to 1.6 million barrels a day. This is an enormous volume, 96 million kiloliters per year, which is equivalent to approximately 40 percent of Japanese crude oil imports. This crude oil is being transported on the basis of priority to the West Coast centered around San Francisco and Los Angeles. However, the refining capability of this region is only 1.1 million barrels a day, and the remaining 500,000 barrels are transported to the East Coast via the Panama Canal for refining.

For passage through the Panama Canal, there is only one way to transport it, and that is by small tanker, and the transportation cost is high. If the 500,000 barrels of crude oil being transported to the East Coast were exported directly to Japan using a supertanker, and in its place, the crude oil that Japan imports from the Middle East, Mexico, etc., were transferred to the East Coast, it would be beneficial to both sides. A change in the crude oil export prohibition policy has become urgent.

It may be called a concept befitting economic rationality. Actually, during the Carter administration, there was an occasion when the leaders of the Alaskan State government actively approached Japan with the proposition.

Up to the Decision of the Reagan Administration

However, the Reagan administration rejected this scheme. A "cabinet meeting on national resources" held on 5 November chaired by Secretary of the Interior Watt gave a negative decision, stating: "The ban on crude oil export will not be repealed." The main reason given was that: "the United States is an oil-importing country, and securing of its own resources is essential for the national security. Even though there may be some lingering irrationality, the export of oil should not be practiced." The concept of giving priority to national security is very strong in the East, and it appeared as though the proposed scheme was completely buried with this decision.

Ironically, however, the issue of the Alaskan crude oil began to be emphasized between the United States and Japan immediately after the U.S. Government decided against lifting the ban on it. The direct cause was none other than an enlarged imbalance in U.S.-Japan trade. The 1981 balance of trade was estimated initially at "\$10 billion in the red for the U.S. side." Even this is an enormous figure. Furthermore, partially due to a low yen caused by high U.S. interest rates, the figure exceeded the \$15-billion mark in October, and it is estimated that it will reach almost \$20 billion in the end.

Regarding the trade deficit with Japan, the rising unemployment rate, and the political environment of the upcoming mid-term election, anti-Japanese criticism has rapidly spread in the United States. Incidents have even taken place in which Japanese cars were damaged by auto workers, and laborers attempted to lower and set fire to the Japanese flag raised along with the Stars and Stripes outside the building where American firms in New York State held a meeting with Japanese representatives whom they had invited.

Unlike the trade frictions related to increased imports of individual items of merchandise such as automobiles, iron and steel, household electric appliances, electronics, etc, found in the past, dangerous signs of it developing into over-all economic friction have begun to appear. Ambassador to the United States Ogaware also warns: "If left alone, the U.S.-Japan relationship will be disastrous."

Based on the directions of Prime Minister Suzuki, the Japanese Government deliberated on a countermeasure as best it could and settled on a 2-year retroactive reduction of the tariff decided at the Tokyo Rounds, building up national reserves of rare metals, and emergency imports of sweet rice, etc. However, these measures have no more prospective effect than "eyedrops from a second story." Thus, they are merely attempts to line up countermeasures that seem like a children's lunch without a conclusive factor.

In the midst of such an irritated state in the United States and headaches for Japanese to find countermeasures, Alaskan crude oil is beginning to receive an enthusiastic look. First, in the United States, a Democratic congressman from Oklahoma, Jones introduced a bill to seek "lifting the ban on crude oil," and began actively promoting it. The objective of the bill, which is in line with reports by the U.S.-Japan Council of wisemen, is affirmed to be that "the U.S. deficit with Japan can be drastically improved if this bill is passed."

In addition, an influential member of the ruling Republican Party in the Senate, S.I. Hayakawa, who is charged with responsibility to promote government policy for Japan, also concluded that "the most effective concrete measure is to export Alaskan crude oil to Japan; by doing so, Japan can lessen the burden and risk of transporting crude oil from the Persian Gulf, and the United States can improve the deficit with Japan by an order of several billion dollars," and has begun congressional maneuvers.

According to his calculation, if the 500,000 barrels of crude oil being transported to the East Coast daily is exported to Japan, the price for the crude oil Japan will pay to the United States will reach some \$6 billion a year, and the trade imbalance between the United States and Japan will be reduced to almost a half with this export alone. And even if the United States imported crude oil from Mexico and the Middle East in its place, the transportation cost would be cut about \$1 per barrel, which would lead to an improved international balance of approximately \$600,000 (annually) at the minimum.

In Japan, the president of the Federation of Economic Organizations, Ineyama, and the chief of the Japan Chamber of Commerce and Industry, Nagano, are vigorously working for it on the basis of advice from Sony Chairman Morita and Idemitsu Kosan Chairman Ishida, among others, in the belief that "this is the only answer." During his U.S. visit at the end of October, President Ineyama attended the "business roundtable" summit conference, which is said to be the influential group of people that control U.S. economic circles, with members consisting of top executives of large corporations, where he directly asked that "the United States lift the ban on Alaskan crude oil if it wants Japan to open the Japanese market."

Furthermore, Mr Nagano conferred with the influential Republican from Alaska, Stevens (Republican Senate assistant majority leader), and his wife last fall under an arrangement made through U.S. Ambassador to Japan Mansfield, and in direct talks with him requested "his unfailing cooperation regarding the oil supply to Japan."

This move was spurred by the visit of Mr Shapiro, who is affiliated with the U.S.-Japan Association. The association has played an important role in various problems in the past. Mr Shapiro is a lawyer with an office in New York and is said to be an adviser on the U.S. side. He visited Japan in mid-November last year and met with the president of the Federation of Economic Organizations, Ineyama; the chief of the Japan Chamber of Commerce and Industry, Nagano; leaders in economic circles; and influential representatives of the Liberal Democratic Party; he convinced them before returning home that "there is no other solution but Alaskan crude oil for the U.S.-Japan trade friction." The main point was said to be that "if Japan presses hard, U.S. policy prohibiting crude oil exports can be changed."

The Liberal Democratic Party jumped on this "Shapiro information." Secretary-General Nikaido expresses a positive view every time the topic of trade friction arises, stating: "There is the Alaskan crude. If we press seriously, the United States is likely to accept it." There is even optimism running through the party that U.S.-Japan trade friction can be resolved at one stroke if only Alaskan crude can be imported. Thus the present "Abe proposal" came into being.

The Only Bargaining Power!?

However, there are hurdles to overcome in order to realize the importation of Alaskan crude. For example, there is the problem of which country's crude to swap. The volume of Japanese crude imports is being drastically reduced due to progress made in energy--conservation investments and a standstill in the business boom.

The volume of imports in the first half of this fiscal year (April-September) was approximately 110,000 kiloliters, which is a 10-percent reduction compared to the same period of the previous year. It is a completely different situation than in the past when they were scampering to secure oil imports. Various sole distributors of oil are trying hard to cut back the volume of imports after filling up their reserve tanks. Consequently, it may be difficult to say "we have decided to buy Alaskan crude, so we would like you to sell that share of your crude to the United States" for Japanese convenience alone.

For example, several years ago during the second oil shock, Japan signed a contract to import 160,000 barrels/day of Mexican crude in return for an enormous sum of economic cooperation, and the idea of swapping with the United States was secretly discussed, but it was decided to "import as contracted" as of last year. From the Mexican point of view, it had apparently figured that if it agreed on the swap with the United States so easily, it might not be able to elicit additional economic cooperation from Japan. The relationship with Middle Eastern oil-producing countries is similar, as it is tied to various types of economic cooperation; and from the standpoint of the type of oil, too, swapping is viewed as not such a simple matter.

However, depending on efforts made, it may not be impossible. Last fall, the president of the Federation of Economic Organizations, Mr Ineyama, visited several countries in the European Communities as the leader of an economic delegation and is said to have personally sensed the strength of "external pressure." He insists on looking beyond the swapping issue based on the judgment that there is a general current of opinion that "the U.S.-Japan relationship is the key issue of importance to Japan above all else. If ignored, it may become a problem that shakes up Japan involving the defense issue as well. If we had nothing to buy, it would be a different matter. But if we can buy crude oil, I think we should import it by whatever means available."

In addition, the "Petroleum Association of Japan," the organization of petroleum sole distributors which are directly involved, does not deny the possibility, either, stating: "Diversification of the source of importation is necessary in the long-term view. In that sense, the importation of Alaskan

crude is desirable and we in the association are also studying the matter. Swapping is certainly difficult to accomplish, but with the full support of the government and economic circles, the way to break through the obstacles is not totally hopeless" (managing director Tai).

The Alaskan crude issue which originated as a proposal by the U.S.-Japan Council of Wisemen stands on the premise of swapping on a private basis. However, the idea of advancing it one more step and linking it to the national reserve is also being discussed. It is a proposal being hurriedly compiled led by the oil problem investigation committee of the Liberal Democratic Party (Y. Fujita, committee chairman), and the gist of it is not to consider swapping in the private sector, but to have the Japan National Oil Corporation import the oil to put it into the national reserve.

Chairman Fujita expressed his enthusiasm, stating: "The Japan National Oil Corporation has been investing enormous funds into oil development, but to our regret, most of them were misses. It is more realistically profitable for this development fund to be cut back and turned to the importation of Alaskan crude. If we have no room to store domestically, we can build petroleum tanks in Alaska and store locally. The United States can import crude oil needed from the other oil-producing countries with the money it earns by selling Alaskan crude to Japan. Basically, there should not be any problem. We would like to complete the final proposal as soon as possible and submit it to the formal organ of the party."

Riding on the "Alaskan crude fever" of the Liberal Democratic Party and economic circles, the Ministry of Foreign Affairs, which serves as a window to negotiations with the United States, has also confirmed its policy of using this issue as a wild card. The North American Bureau states: "If the United States agrees to lift the ban and importation is realized, it will be an epochal achievement toward the solution of trade friction. Even if it is not achieved, considering the current posture of Japan being on the defensive with the United States thrusting for the opening of the Japanese market, Alaskan crude is the only proposal we can present to the United States, and proposing it will undoubtedly become a bargaining tool to make the negotiation advantageous at the minimum. We would like to reach a decision in that direction within the administration." (North American Division II).

Regarding the U.S.-Japan trade friction problem, demands have always been put forward by the United States. This time, the idea is to counterattack, demanding that the United States "make an effort, also." It will not be a mistake to position the "sprout" to develop positive diplomacy for the first time in negotiations with the United States.

As to the outlook for realization, however, many have negative views. President Hiraiwa of Tokyo Electric Power Co positively stated: "It is a dangerous concept to use oil that involves American national security as an economic tool." Mr Ineyama, president of the Federation of Economic Organizations, who was initially enthusiastic about the idea, is said to have changed to a cautious theory recently. However, Alaskan crude still holds an attractiveness too great to abandon as a bargaining tool in negotiations with the United States.

In this respect, the Alaskan crude issue will definitely have divers effects on U.S.-Japan negotiations, regardless of its realization or failure.

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CSO: 4105/61

SCIENCE AND TECHNOLOGY

URANIUM ENRICHMENT PILOT PLANT BEGINS OPERATION

OW261131 Tokyo KYODO in English 0947 GMT 26 Mar 82

[Text] Ningyo-toge Pass, Okayama Pref 26 March KYODO--A pilot plant for enriching uranium, which will be used as fuel for lightwater reactors, began operating at full capacity Friday.

The plant, the third one in the world using the centrifugal method, has been constructed by the power reactor and nuclear fuel development corporation in an effort to make the nuclear fuel cycle in this country a purely domestic operation.

One of the two other uranium-enriching pilot plants was built by United States interests and the other by URENCO, a joint venture grouping West German, Dutch and British firms.

Data on the Japanese pilot plant's capacity is a closely guarded secret but officials concerned believe it has a capacity equivalent or superior to the URENCO plant.

The corporation started building the pilot plant in April 1978 and partial operation began with 1,000 centrifuges in September 1979. The plant was completed at a cost of yen 58 billion (dollar 237 million) and the number of centrifuges employed raised to 7,000 in three stages.

Originally, the pilot plant's capacity was set at 50 tons SWU (separation work unit) a year but it is actually believed to be 70 tons SWU because of the improved performance of the centrifuges.

About 15 tons of 3 percent enriched uranium will be produced annually, enough to enable a nuclear power station with a generating capacity of 600,000 kilowatts to operate for a year.

A uranium-refining plant to produce uranium hexafluoride from uranium ore also started operating Friday. Uranium hexafluoride is used in the enrichment of uranium.

The government now plans to build a commercial plant to enrich uranium and begin limited operations in the late 1980's. The plant's capacity will be raised to 3,000 tons SWU a year around 2000.

CSO: 4120/212

SCIENCE AND TECHNOLOGY

SURVEY OF SCIENCE, TECHNOLOGY RESEARCH EXPENDITURES

Tokyo KAGAKU SHIMBUN in Japanese 22 Jan 82 p 1

[Text] Research Expenditures Up 14.5 Percent (in Comparison to the Previous Year); Government Share Decreases Further

The Planning Bureau of the Science and Technology Agency has recently published the "1981 Science and Technology Research Status Survey." This is a survey of the major research expenditures of companies, research organizations, and universities, and the total number of researchers and their numbers according to specialty.

Total science and technology research expenditures for 1980 in Japan were 5,246,200,000,000 yen, an increase of 662.6 billion yen over 1979 (4,583,600,000,000 yen). The rate of increase over the previous year was 14.5 percent, 1.2 points higher than the 13.3 percent rate of increase for 1979.

Research expenditures in the recent past have progressed at a double digit rate of increase--11.6 percent in 1976, 10.0 percent in 1977, and 10.8 percent in 1978.

Also, the real rate of increase in research expenditures rose from 5.3 percent in 1979 to 6.1 percent. The real rate of increase in the past gradually rose from an increase of 1.1 percent in 1975 to 2.3 percent in 1976, 3.9 percent in 1977, and 7.2 percent in 1978. In 1979 the rate of increase fell slightly to 5.3 percent, but it rose again in 1980.

The percentage of GNP spent for science and technology research grew from 2.07 percent in 1979 to 2.19 percent. Of the total research expenditure, 4,683,800,000,000 yen or 89.3 percent went to the natural sciences. This was an increase of 15.3 percent over the previous year.

The breakdown by type of research organ was as follows: Corporations spent 3,142,300,000,000 yen or 59.9 percent of the total. This was 1.8 points above the 58.1 percent of 1979. Universities spent 1,340,100,000,000 yen or 25.5 percent. Research organizations spent 763 billion yen or 14.6 percent of the total.

The rate of increase over the previous year was 17.9 percent for corporations, the highest rate since 1975. Research organizations had an increase rate of 15.7 percent, more than the 9.4 percent increase over the previous year. The increase

for universities was 6.5 percent increase over the previous year, much lower as compared with a 9.3 percent increase seen in the previous year, and the lowest growth rate in the last 10 years.

The actual research expenditures of corporations increased by 8.9 percent and that of research organizations increased by 7.6 percent, both greater than 1979 (increases of 7.6 percent and 2.3 percent). However, universities dropped from the 2.2 percent increase of 1979 to 0.8 percent.

Private Burden Grows to 72 Percent

The share of research expenditures borne by national and local government organizations and the private sector is as follows: The private sector's share was 3,776,300,000,000 yen, an increase from 70.4 percent in 1979 to 72.0 percent. In contrast, national and local government organizations spent 1.465 trillion yen, a reduction from 29.5 percent in 1979 to 27.9 percent.

The rate of increase over the previous year for private research expenditure was 17.0 percent, higher than the 14.3 percent of 1979. The rate for national and local government organizations was 8.2 percent, less than the 11.0 percent of 1979. (Special corporations such as the Japan Nuclear Energy Research Institute and the Institute of Physical and Chemical Research are included under national and local research institutions; public corporations with independent accounting such as Nippon Telegraph and Telephone Public Corporation, the Japan National Railways, and the Nippon Broadcasting Corporation are included under the private sector.)

In a breakdown according to special objectives, 164.6 billion yen went for information processing, 144.3 billion for environmental preservation, 92.9 billion yen for space development, and 29.5 billion for marine development. The total for these items was 431.3 billion yen, or 8.2 percent of total research expenditure.

Broken down by type of research organization, for corporations, information processing increased by 19.3 percent but space development decreased by 29.2 percent and marine development decreased by 5.8 percent. For research organizations, marine development grew by 13.1 percent and environmental preservation grew by 6.2 percent, but information processing decreased by a large margin, 45.4 percent. Also, for universities, marine development rose by 28.7 percent but information processing fell by 30.6 percent.

Electronics Industry Spent One-Fourth of the Total Corporate Research Expenditure

The number of regular researchers as of 1 April 1981 was 379,400 (57.9 percent of the total number of persons engaged in research). This was an increase of 15,900, or 4.4 percent over 1980. This was less than the 6.5 percent increase achieved in 1980 over the previous year.

The amount of research expenditure per regular researcher was 13.83 million yen, an increase of 1.22 million yen or 9.7 percent over 1979. The growth rate has been 6 to 9 percent since 1975. Broken down by type of organization, research organizations spent 22.70 million yen, corporations spent 17 million yen, and

universities spent 8.33 million yen. The rate of increase over the previous year was 10.5 percent for corporations, 9.5 percent for research organizations, and 4.9 percent for universities.

The total spent for research by corporations was 3,142,300,000,000 yen. The greatest part of this amount, 81.72 million yen or 26.0 percent of the total, was spent by the electrical equipment industry. Next was the chemical industry with 55.83 million yen or 17.8 percent of the total, the transportation equipment industry with 510.5 billion yen or 16.2 percent, and the machinery industry with 218.9 billion yen or 7.0 percent. These four industries accounted for 67 percent of the research expenditure of corporations.

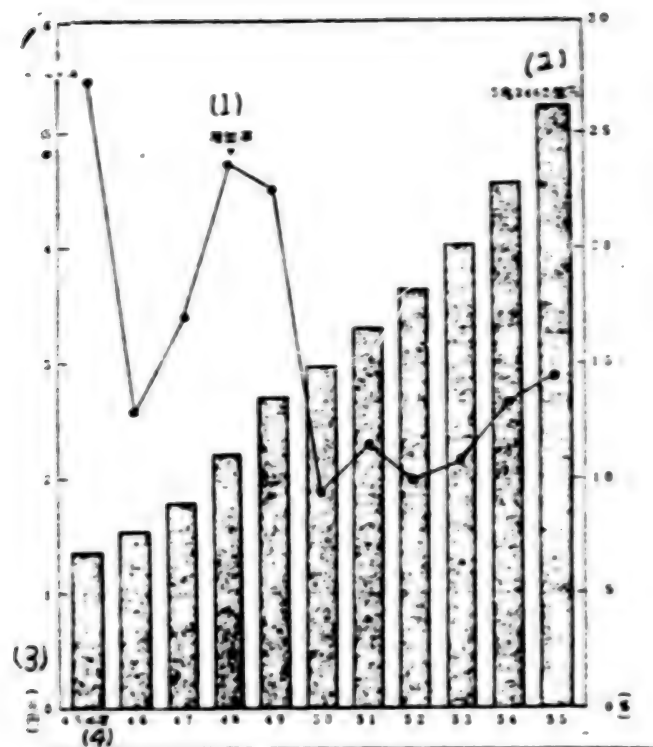
Reduction of Technology Import Expenditure

In 1980, there were 4,103 cases of technology exports by corporations. This was an increase of 436 cases over the 3,667 cases in 1979. For this, there were receipts of 159.6 billion yen, an increase of 26.5 billion yen over the 133.1 billion of 1979. The rate of increase over the previous year was 19.9 percent, compared to 9.1 percent in 1979.

The number of cases of technology imports, on the other hand, was 7,012, an increase of 2,316 cases. The amount of payment was 239.5 billion yen, less than the 1979 figure of 241 billion yen. The rate of increase for 1979 was 25.5 percent, but it fell to a decrease of 0.6 percent in 1980. This was the only time this happened in the last 10 years, except for a decrease of 29.8 percent in 1974.

The amount of receipts was 1.81 times the amount of payments in 1979, but this fell to 1.5 times in 1980. The amount of payments was 4.12 and 4.48 times the amount of receipts in 1972 and 1973, a very high rate. The rate fell to 2.8 times in 1974, and in 1978 it dropped below the double level to 1.5 times. So there has been a downward tendency. Looking particularly at new technology exports and imports, we see that from 1975 onward both the number of cases and amount of money for technology exports has been greater than that for technology imports.

Looking at separate types of manufacturing industries, we find that the largest receipts (for technological exports) were received by the chemical industry, 31.6 billion yen. However, this was a drop of 6.3 billion or 16.6 percent from the 1979 figure. The second place electrical equipment industry, on the other hand, received 23 billion yen, an increase of 20.9 percent. Next was the transportation equipment industry with 21.8 billion yen, a 39.6 percent increase.



Key:

1. Rate of increase
2. 5,246,200,000,000 yen
3. Trillion yen
4. 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980

9651

CS0: 4106/64

SCIENCE AND TECHNOLOGY

DEVELOPMENT ACTIVITIES OF NTT'S RESEARCH INSTITUTES DESCRIBED

Tokyo TOKI NO KEIZAI in Japanese Jan 82 pp 76-81

[Text] Part I (Present)

Two percent of Income Invested for Research and Development

There are three research institutes established within the Nippon Telegraph and Telephone Public Corporation as facilities to deal with research and practical implementation of systems, machinery equipment, parts and materials for electric communications which are the business of the NTT. They are Musashino Electric Communication Research Institute (Musashino, Tokyo), Yokosuka Electric Communication Research Institute (Yokosuka, Kanagawa) and Ibaraki Electric Communication Research Institute (Tokaimura, Ibaraki).

The number of research workers is approximately 3,100, of which 1,700 work in Musashino ECRI, 1,100 in Yokosuka ECRI and 300 in Ibaraki ECRI.

Furthermore, it is a general rule that 2 percent of the income will be appropriated for R & D expenditure as the budget of the research institutes.

Roughly classifying the research topic at each research institute, the largest research institute, Musashino ECRI, is conducting basic studies in future communications and information processing systems and new parts and materials, in addition to research and practical implementation of electron exchange systems, memory systems, semiconductor integrated circuits (IC and LSI) and semiconductor parts. As is well known, the LSI development capability of this institute is preeminent in the world. In February 1980, a super LSI with a 256 K bit dynamic RAM (random access memory) was created for the first time in the world.

Yokosuka ECRI mainly deals with R & D relating to data communications. Research on future information processing technology is in progress, in addition to efforts being made for practical implementation of a data communication information processing system (DIPS) and data communication network architecture (DCNA). Meanwhile, Ibaraki ECRI is concentrating on research and development of basic materials such as optical fibers and connectors, considered to be the ultimate means of communication to cope with the ever increasing volume of information.

The above is a generalization of the three research institutes of NTT, which has built up a technology kingdom. Recently, there was an incident that gave a hint

of the excellence of its technological level. Simply, it was the conclusion of a cross-license (patent sharing) contract and exchange of notes regarding a technological information exchange between American IBM and NTT.

It is said that the present cross-license was realized due to an intensive approach from IBM. Indeed, this was not the first time IBM had brought up the cross-license proposal to NTT. As early as 1970, IBM suggested a cross-license deal, as it took a note of NTT's technological capability. Getting into the details of the story, NTT declined IBM's proposal in view of the fact that computers and the communication field were not as closely related then as today: "We don't welcome IBM extending its business even into the field of communications."

However, the remarkable progress of electronic technology today has woven communications and computers into an intimately interacting relationship. That brushed away the excuses for NTT to reject IBM's proposal, and consequently, the cross-license contract was recently concluded.

IBM is well known as the world's largest computer maker, holding 30,000 patents, a true "hero" in the computer world. On the other hand, the patents held by NTT are also rapidly increasing; for instance, a doubling from over 4,900 patents in FY-70 to 9,800 patents in FY-80, including a large number of the most advanced technology patents pertaining to super LSI and low loss optical fiber manufacturing methods. NTT has become a well established "hero" of the communications world.

The fact that this contract allows these "two giants" to share free of charge the patents held by each and to exchange engineers and technological information as they please, can be regarded as a herald of the dawn of a new era in the electronic technology field, and the technological reform of tomorrow will be rapidly accelerated.

Construction of the Fourth ECRI

NTT is currently building a fourth research institute (the fourth ECRI) in Atsugi, Kanagawa. The grounds of this research institute occupy 200,000 square meters, and the building measures 46,000 square meters in total floorspace, with four floors above and two to three floors below ground. If the construction work progresses as scheduled, it is expected to become a new center for super LSI research in Japan by March 1983.

Up to now, semiconductor research including super LSI has been conducted at Musashino ECRI. As mentioned previously, the world's first super LSI with a 256 K bit RAM was created there in February 1980. However, the super LSI era, which started with the practical implementation of a 64 K bit RAM, will enter into full maturity from now on. The world's semiconductor makers are trying to outdo each other in developing more highly integrated super LSI, and NTT also can never allow any loose screws in its work. The construction of the Fourth ECRI designated as a super LSI speciality research institute symbolizes NTT's determination to stay on top.

In this research institute, a complete experimental line, from silicon vacuum dissolving furnaces to super LSI production, for materials, designs, fabrication

and inspection will be built. Also, another important feature of the institute is the installation of a clean room wing where even minute dust particles, the most formidable foe in manufacturing super LSI, of micron size (one one-thousandth of a millimeter) is removed. In this wing, it is planned to study new devices such as optical communications optoelectronics elements and Josephson elements, that is, silicon MOS and bipolar super LSI semiconductor lasers. At present, no makers or research institutes in the world are involved in the development of a so-called real super LSI, a 1 M bit RAM, but it is generally viewed that the first model of such a device "will be produced in Japan in a couple of years." That can be interpreted that the first model of a 1 M bit RAM will be delivered at Musashino ECRI if the development schedule is advanced, or at the fourth ECRI if it is delayed.

Far Ahead of Others in Super LSI

Incidentally, IC and LSI are fabricated using masks etched with circuit patterns like making copies of photographs from negative film. The point in this process is how to etch detailed patterns on a chip several millimeters square. The improvement in the degree of integration requires technology for producing more detailed patterns. Patterns of the currently mass-produced 64 K bit RAM are formed in a line width of 3 microns using ultraviolet exposure technology. More highly integrated super LSI will require line widths of 2 microns and submicrons below 1 micron. However, a line width of around 2 microns is the practical limit by the conventional optical exposure method from the aspect of wavelength.

What will break through this limit are the electron beam exposure and x-ray exposure technologies. It was the adoption of the electron beam exposure technology that brought NTT's success in the development of a 256 K bit RAM. In other words, the key to the development of super LSI depends indeed upon the development of these micro-fabrication technologies.

In June 1981, Musashino ECRI successfully developed an electron beam exposure device which could reduce the smallest etching pattern size to a submicron range of 0.5 micron. The device, named "High Precision Electron Beam Exposure Device EB 55," etches 0.5 micron patterns on one sheet of 4-inch wafers in 60 minutes, and the device claims a high precision performance of plus/minus 0.1 micron in pattern laying accuracy. The practical limit of the smallest etching pattern size of the conventional electron beam exposure device was at best 1 micron. In contrast, "EB 55" raised the conventional electron beam acceleration voltage 150 percent to 30 K volts, adopted vector scanning (only designated patterns to be exposed will be scanned and irradiated) as a beam scanning method in order to correct the neighboring effect, which changes shapes and dimensions of patterns by the effect of neighboring patterns, and succeeded in reducing the smallest workable features all the way down to the submicron range.

This "EB 55" is the world's first electron beam exposure device which can be put into practical use for experimental production of a super LSI with the smallest pattern size 0.5 micron. Now, we may be justified in assuming that the groundwork is practically completed for NTT to be the first developer of the so-called real super LSI, a 1 M bit RAM, due to the development of "EB 55."

Meanwhile, in the field of ROM (read only memory), which is indispensable for Japanese-language word processors (automatic documenter), already a 1 M bit ROM has been completed, and a small portable Chinese character printer has been made practical using this ROM.

In order to store Chinese characters in the ROM, 576 bits are required for one letter. A conventional 64 K bit ROM can store only 113 letters per chip, so nineteen 64 K bit ROM's are needed to store 1,945 Chinese characters in common use and 166 Chinese characters in use for people's names. In comparison, 1,820 Chinese characters can be stored per chip when a 1 M bit ROM is used, which means that two chips can very well manage to store all the Chinese characters in common use and in use for people's names if necessary.

The 1 M bit ROM for Chinese character pattern generators previously developed by ECRI is capable of containing 3,760 letters on a chip approximately 2 x 3 cm in size, because of the adoption of a memory cell suitable for defect tolerance technology and high densification.

Successful in Space Experiments

It is already an established fact that events occurring in every country in the world can be instantly viewed on a TV set in the family room after the practical implementation of communication satellites. The future role of communication satellites will be further enhanced concurrently with the increase in information volume.

NTT is also proceeding with research on future satellite communications systems which use communication satellites in place of surface coaxial cables and micro communications networks. It has recently succeeded in an experimental LSI operation using a preliminary test rocket loaded with LSI memories.

In communications systems that use satellites, radio waves from satellites are received by a multibeam antenna installed on the ground. However, satellite communications that use multibeam antennas not only require switching and connecting of different beams on satellites, but also conversion of signals on satellites to render various services to subscribers such as mobile communication, data, picture and facsimile services. Evidently, a small, light satellite computer with large capacity memories is necessary to handle these tasks on satellites.

However, space is different from the surface environment; for example, a vacuum state exists and cosmic rays are constantly flying in every direction. With this in mind, NTT actually launched a rocket loaded with a test device which incorporated LSI memories for an experiment to see if a computer could function normally in such an environment.

The test device loaded on the rocket had sixteen 64 K bit RAM's and sixteen 16 K bit RAM's built in. During the experiment, the device repeatedly performed read-write functions for 7 minutes and 24 seconds from liftoff to splashdown, and the data was transmitted to a surface station and recorded on magnetic tape. The test results confirmed that all LSI memories worked normally without exception.

Such an experiment as described above is said to have been executed for the first time not only in Japan but in the world. This success contributed to NTT's one-step lead above all others even in the practical implementation of satellite communication computers.

Practical implementation of speech synthesis technology using LSI has begun. The parcor system invented by NTT is the system most frequently used in the world.

There are several systems in speech synthesis technology. Among them, what is called the analytic synthesis system does not record and reproduce wave forms of speech themselves but characteristic parameters (variants) extracted from the wave forms. The parcor system is a variation of this system. It focuses attention on the sound source information which expresses the characteristics of the throat and on the shape of the mouth to synthesize speech based upon the information extracted from those focal points. It is characterized by the fact that it requires only one LSI chip to do the job.

Leading Also in Optical Communications

Finally, here is an introduction to the most advanced technology which NTT presents proudly to the world. It is technology related to optical communications.

As is known, a communication system which uses laser beams is regarded ideally as a key resource of the technetronic information era or as a dream of communication means; it is characterized by the following improvements through the use of laser beams for transmission of data compared to conventional microwaves: approximately 1,000 times more data carrier capacity, free of electric and magnetic disturbances, free of sparks and free of radio interference.

However, in order to realize this optical communications system, it is necessary to develop optical fibers and semiconductor lasers.

Optical fibers are equivalent to conventional telephone wires and transmit laser beams to distant locations. The significant point of the practical implementation of this optical fiber is to develop fibers that have a low loss value.

Since 1980, NTT has been working on the development of optical fibers jointly with a wire maker, and has developed a new technology called the vapor axial deposition (VAD) method. This VAD method was the epochal invention that gave Japan, which was trailing the United States, a chance to come shoulder to shoulder and surpass it in the optical communications field. Without going into detail, compared to the American Bell Laboratories' MCVD, which was in the mainstream before the new method, the manufacturing process of the VAD method can accommodate continuous manufacturing and large size manufacturing (over 50 km in terms of optical fibers), and it is also characterized by a speedy synthesizing rate and the use of inexpensive, low-purity raw materials. This method realized inexpensive, mass-producible optical fibers, clearing one of the hurdles of the optical communications system.

Later, in September 1980, NTT succeeded in developing what appeared to be the ultimate super high purity optical fiber in the category of quartz optical fibers using the VAD system. This optical fiber is characterized by a broad wavelength

range of 1.2-1.7 micron and an extremely low loss, less than 0.5 dB/km (transmittivity above 90%/km). Considering that the transmission loss characteristics of the first low loss optical fiber usable for communications developed by American Corning 10 years ago was 20 dB/km (transmittivity 50%/100m), it is clearly evident that NTT's optical fiber shows truly a very low loss.

In March 1980, NTT successfully developed a semiconductor laser which claims a service life of above 100,000 hours. With this invention, NTT also became the first to make a practical semiconductor laser for optical communications. It is a 0.8 micron band semiconductor laser of double hetero structure made of gallium, aluminum and arsenic.

Likewise in October 1981, the corporation developed a practical 1.5 micron band semiconductor laser. Optical fiber loss is minimum at 1.5 micron wavelength, which is why the 1.5 micron is called the prospective winning wavelength for optical communications. Therefore, the 1.5 micron band semiconductor laser, which emits highly pure radiations, is regarded as the next generation laser, and its development is awaited with great anticipation. The one developed by NTT is made of indium, gallium arsenic and phosphorus, and the distinguishing characteristic of the invention is the undulating structure on the section within the semiconductor laser, provided to give strong wavelength selectivity.

Use of the semiconductor laser makes it possible to transmit a large volume of information at a high speed to a far away destination; it is especially suitable for ocean optical cable transmission. Also, the new invention opened an easier way to develop solid integrated optical circuits that combine light-receiving elements and amplifiers, which was difficult to achieve using the conventional semiconductor laser.

Part II (Past)

What "Communication Pole" Implies

Various most advanced world renowned technologies of ECRI are particularly dazzling. In retrospect, the history of ECRI exceeds 90 years, since 1891, when an electric experiment station which was the embryo of the present ECRI was installed within the former Electric Bureau of the Ministry of Communications. The history is shorter than that of research institutes in Europe and America. However, the history of ECRI will soon reach a full century, and it seems finally about to enter into the flowering period.

The electric experiment station became independent as an extraministerial bureau of the Ministry of Communications in 1909, at which time it had already established its status as one of the best experiment and research facilities in Japan.

After the war, in 1948, the electric experiment station which served both as a power sector and a communications sector split into two independent research facilities. Of the two, the communications sector remained in the Ministry of Communications and was reorganized as the Electric Communications Research Institute. It is very interesting to note that at this time the organization was

started again as a research institute posting practical implementation as its final goal rather than a purely academic research institute.

The present Musashino ECRI took its first step in 1950 by concentrating branch offices which had spread all over Japan on the site of former Musashino workshop of Nakajima Aircraft. In 1952, Nippon Telegraph and Telephone Public Corporation was organized as a public corporation to operate the public electric communication business of Japan.

Ibaraki ECRI was first opened in 1960 as the Ibaraki branch office (it became independent in 1971 as Ibaraki ECRI), while Yokosuka ECRI was created in 1972.

Incidentally, what is now called an electric pole was called a communication pole up until very recently. This clearly says that communication poles supporting communication lines were in popular use before electric poles supporting electric wires.

It was in 1869 when telegraphic communication was established between Tokyo and Yokohama. The main line Aomori-Tokyo-Nagasaki was founded as early as 1871. This also indicates that the government of the Meiji era was eager to obtain local information expediently in light of the fact that the political situation was not well stabilized. This communication network is considered to have been a great contributor during the War of Seinan (1877). The foresight of the government of that time is really amazing. Likewise, it is not difficult to imagine that it also emphasized research, as it is evident that the importance of facilities for communications were respected early on.

The two greatest goals of telephone service, "instant operation" and "instant connection," were achieved in FY-77 and FY-78, and telephone communication is now part of our daily life like water and electricity. This popularization can also be said to have resulted from the research work which had been conducted for quite a long time in appreciation of the importance of the communication business.

Part III (Future)

In the Midst of Expanding to International Scale

Today, one century after the start of the electric communication business, we do not need to be reminded of the ever increasing importance of the electric communication business.

"In the rapidly growing electric communication technology throughout the world, England must not retreat to a subordinate position" (England). "It is a serious problem that important data regarding our nation is accumulated abroad and the maintenance of Canadian sovereignty is jeopardized" (Canada). "The future electric communication business will not be the extension of telegrams and telephones. Electric communication is equivalent to the nervous system and is organically combined to give order to various activities of the entire society, encompassing primary industry and secondary industry, along with tertiary industry that is built upon the sound activities of the first two. In this sense, the electric communication business is seriously related to the future of Japan, and a mistake in

direction in this field might even endanger the existence of Japan in the 21st century" (Hisashi Shinto, president of NTT). As revealed by the above statements, the electric communication business will not be contained within a country, but will expand to international scale with the coming of the technetronic information society, and it is urged that the electronic communication business find new roles to play.

Consequently, ECRI cannot remain unconcerned about these developments. Although it is working with the world's most advanced technology, ECRI cannot relax its efforts and labor in the slightest.

It is often mentioned that there are less research workers and smaller research and development expenditure in Japan than in Europe and America. Speaking of the number of research workers, for instance, the number is approximately 26,000 in the U.S. Bell Laboratories, including some 1,500 workers in basic research, whereas the same numbers in ECRI are, as stated at the beginning of this article, 3,000 including 200 workers in basic research. As seen in the marriage of communications and computers, what makes the great difference in the future will be the general technological capability, that is, accumulation of a broad spectrum of basic technologies. As indicated by the comparison of the numbers of basic research workers, this point raises great concern. It is a question of how much the Japanese research camp can cover the shortage of personnel by its worship of efficiency and gift of vision.

On the other hand, internationalization will be demanded naturally with the expansion of the communication business to world scale. A material procurement controversy pressed by Europe and America was tentatively dissolved at the end of 1980 with the promise to free materials. However, criticism of the so-called Japan Corporation, the research and development system under the united efforts of the public and private sectors, is expected to increase in proportion to the distance in super LSI and optical communication systems by which NTT leaves behind all other contenders. In reality, it seems that the previously described cross-license contract with IBM was in part undertaken to dampen these criticisms to a minimum. How to deal with these problems will become an essential issue in the future.

Strategies Conquer All

During the recent visit of this reporter to Musashino ECRI, concrete figures on research and development expenditure (budget) were not shown. It is because, they say, "a public announcement of specific figures would give hints as to what areas of studies ECRI emphasizes or is going to emphasize." This concern is expressed in light of the fact that the most important issue is the future direction to be followed, and research facilities in every country in the world are groping to find the most promising direction.

America makes astronomical R & D expenditures every year for development of science and technology. However, due to the deficiency that the funding has been concentrated in the so-called "big three"--defense, space and nuclear power--America has reluctantly allowed Japan to move quickly ahead of it in the electronics field, which is growing at a remarkable pace. The same can be said about

West Germany and France, where the priority given to nuclear power brought today's unfavorable situation.

The three most advanced technologies that built up the "technology kingdom" of NTT, super LSI technology, optical fiber technology and digital technology, which has not been mentioned in this article, were tactically designated in about 1975 as priority technologies to be explored. However, this decision was made, according to some intellectuals, by "a nearly accidental selection" rather than by the foresight of NTT.

Now that Japan has surpassed Europe and America after a persistent drive to catch up and outdistance them, ECRI is being asked to chart its own course in the future by its own resources.

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CSO: 4106/58

JAPANESE OIL EXPLORATION AND DEVELOPMENT ACTIVITIES

Tokyo JAPAN PETROLEUM & ENERGY WEEKLY in English Vol 17, No 10, 6 Mar 82 pp 7-9

[Text] The Tokyo-based Canada Oil Sands Co., Ltd. (CANOS) started in April 1981 the electric preheating of the oil sand deposits at a pilot site within the Lease #81, Athabasca, Alberta, Canada, and the temperature of the oil sands is expected to be raised to the targeted 60-65 °C (140-149 °F) toward the end of March. Once the target temperature level is attained, a test steam injection into core holes will be started around May of this year, more than six months later than originally scheduled.

A farm-in agreement was signed on November 22, 1978, between representatives of the "PCE Group" -- i.e., Petro-Canada, Canada Cities Service and Esso Resources Canada -- and a representative of the Japanese consortium (which on December 21, 1978, jointly established Canada Oil Sands Co.), with regard to Japan's participation in the pilot test project for oil sand resources development in 34 leases totaling about 1.24 million acres in Athabasca. Called the "PCEJ" project -- a project equally participated in by Petro-Canada, Canada Cities Service, Esso Resources and Japan Canada Oil Sands (which is a Calgary, Alberta-based wholly owned subsidiary of the Tokyo-based CANOS), with Petro-Canada as the operator -- it envisages total capital expenditures estimated at C\$104 million during the 15-year period of 1977 through 1991 for drilling of core holes and field pilots.

The oil sand deposits are estimated to total 160 billion barrels in place, with commercial production of oil to start in 1992 at a daily rate of 100,000 barrels.

The farm-in agreement calls for Japan's payment of 75 million Canadian dollars in three phases, each phase extending over a five-year period, to acquire a 25 percent undivided working interest of the acreage involved in each phase in accordance with the following scheme:

	<u>Phase I</u>	<u>Phase II</u>	<u>Phase III</u>	<u>Total</u>
Period	1977-1981	1982-1986	1987-1991	1977-1991
Acreage for pilot testing	Abl.250,000 (Land A)	Abl.420,000 (Land B)	Abl.570,000 (Land C)	1.24 million

CANOS's farm-in charge, C\$ mil. (a)	30.8	24.0	20.0	74.8
Acres acquired by CANOS (b)	250,000x25% = 61,600	420,000x25% = 105,000	570,000x25% = 148,000	1,240,000x25% = 314,600
(a)/(b), C\$/acre	500	250	135	250 (avg.)

Under the Phase I program, CANOS was to carry out the following: i) to drill 91 core holes throughout the area (250,000 acres marked "Land A" on the map shown on the next page) for its evaluation, and ii) to undertake electric pre-heating of the structure, followed by a test steam injection at the pilot site within the Lease #81.

Meanwhile, CANOS acquired a 25 percent working interest of the Land A on September 15, 1980, when CANOS's capital expenditure obligation reached a total of C\$30.8 million as shown in the above scheme.

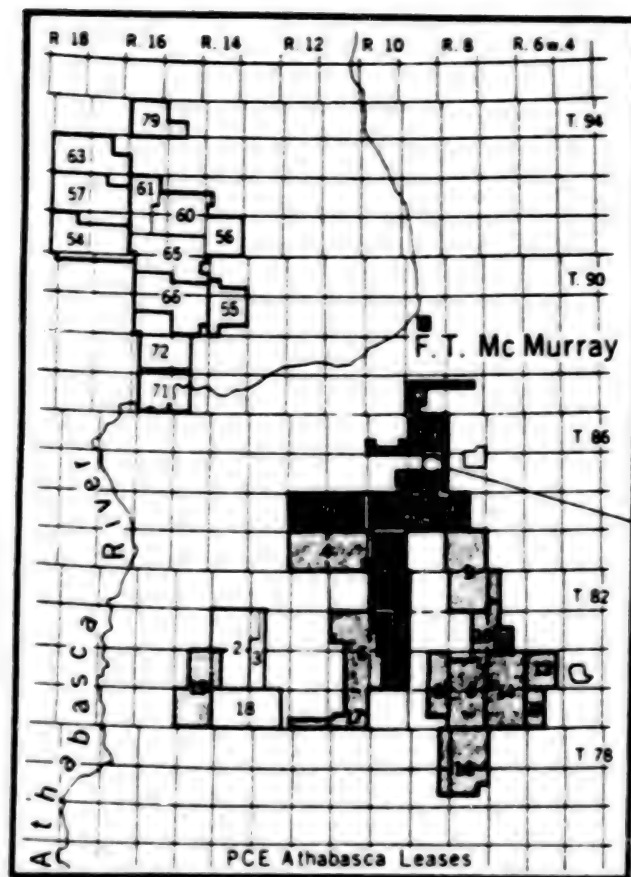
At the end of each phase, CANOS has the option of forgoing further participation in the subsequent phase of the PCEJ project. Nevertheless, CANOS will continue to have a 25 percent say in the managing/technical committee meetings on the phase in which CANOS has fulfilled its obligations and would also have access to patents and technical knowhow developed in the phase(s) involved. Also, if CANOS opts to step down at the end of either Phase I or Phase II, it would hold the right to participate in commercial production in later years in accordance with the working interest already acquired, by paying a commensurate penalty.

CANOS is presently capitalized at ¥8,191 million (\$35.6 million), which is shared by 70 stockholders as shown below, with the governmental Japan National Oil Corp. and the private sector eventually to share the equity capital on an 80:20 basis in favor of JNOC:

	<u>¥ Million</u>	<u>% Share</u>
Japan National Oil Corp.	5,692	69.5
9 Oil companies	850	10.4
12 Public utilities companies	352	4.3
8 Machinery, automobile and heavy industries companies	312	3.8
5 Iron & steel companies	200	2.4
6 Chemical and cement companies	91	1.1
3 Engineering companies	100	1.2
6 Trading companies	120	1.5
20 Banks and insurance companies	474	5.8
	<u>8,191</u>	<u>100.0</u>

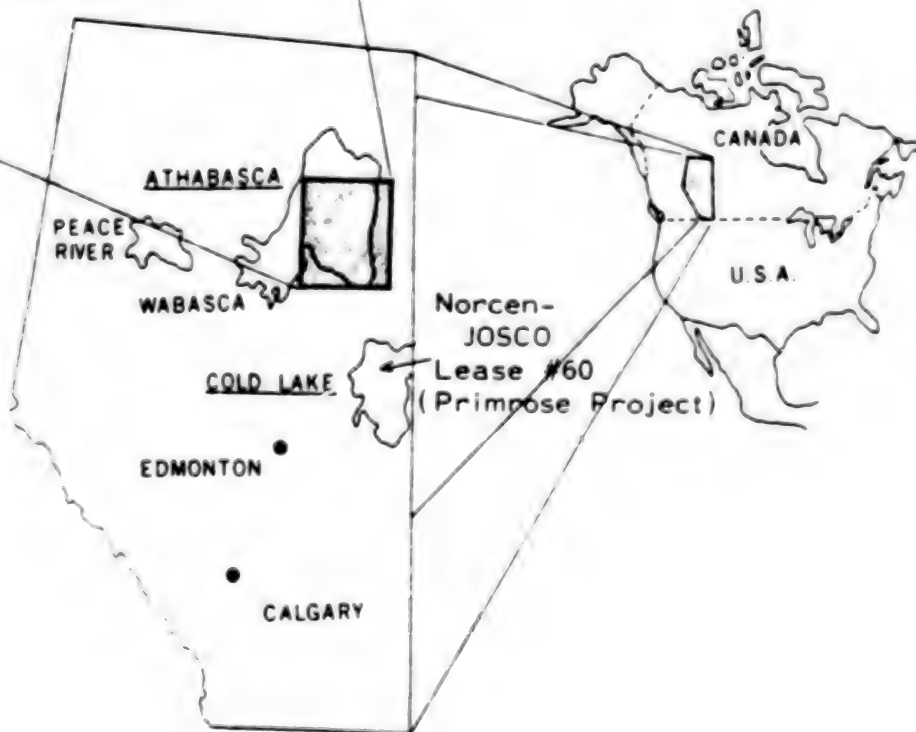
Listed below are CANOS's ten largest shareholders representing approximately 85 percent of the total equity interest:

CANOS/JOSCO OIL SANDS DEVELOPMENT AREAS



- Land A
- Land B
- Land C

Location
Pilot Test
(Lease #81)



	<u>¥ Million</u>	<u>% Share</u>
Japan National Oil Corp.	5,692	69.49
Japan Petroleum Exploration Co.	400	4.88
Nissan Motor Co.	240	2.93
Idemitsu Kosan Co.	120	1.47
Indonesia Petroleum Ltd.	120	1.47
Japan Offshore Ltd.	80	0.98
Nippon Steel Corp.	80	0.98
Industrial Bank of Japan	70	0.85
Long-Term Credit Bank of Japan	70	0.85
Bank of Tokyo	70	0.85
	<u>6,942</u>	<u>84.75</u>

Japan Oil Sands Co. (JOSCO) was established on December 10, 1975, jointly by Japan National Oil Corp. and ten private oil companies to promote Japan's participation in the "Primrose Project" in Cold Lake, Alberta, Canada. The project started producing bitumen oil in October 1976, and its cumulative production reached approximately 102 thousand barrels by the end of 1981, which has been consumed as the project's own fuel. Under the farm-in agreement, JOSCO acquired a 50 percent working interest of the entire area of the Lease #60 (having a total area of 16,939 acres) on December 31, 1980, when obligatory capital expenditures totaling C\$11.25 million -- 75 percent of total C\$15 million -- were completed. Oil sands deposit in place are estimated at 520 million barrels.

Japan's initial entry into the Canadian oil sands development project dates back to March 9, 1974, when a wholly Japanese-owned firm, "Fuyo-Marubeni Oil & Gas of Alberta, Ltd." (FMOG) was incorporated in Alberta. FMOG was equally owned by the Tokyo-based Fuyo Petroleum Development Co. and Marubeni Corp. FMOG and Canadian Industrial Gas & Oil Co. (CIGOL) signed an agreement on May 10, 1974, under which FMOG spent C\$1.5 million until June 1975 to acquire a 50 percent working interest in the first-stage of the Primrose Project.

As the foregoing FMOG-CIGOL first-stage program justified further investment in the Primrose Project, a new company, "Japan Oil Sands Co., Ltd." (JOSCO) was established in Tokyo as stated above. At the same time, Calgary-based FMOG changed its name to JOSCO Primrose effective December 31, 1975. JOSCO Primrose is now owned by JOSCO and Marubeni on an 83:17 basis in favor of the former.

Meanwhile, CIGOL was replaced by Norcen Energy Resources, a successor of Northern and Central Gas Corp. which absorbed CIGOL. JOSCO Primrose and Norcen are now carrying out the second-stage program of the Primrose Project, which consists of a 2.5-year pilot phase and a 3-year prototype phase. Ten holes were drilled for steam injection and production by a "huff-and-puff" method has been under way since September 1976. A U.S. firm reportedly is now studying the possibility of farming in the Primrose Project.

JOSCO is now capitalized at ¥3,640.89 million (US\$15.8 million), which is shared by the following eleven stockholders:

	<u>¥ Million</u>	<u>% Share</u>
Japan National Oil Corp.	1,886.00	51.80
Japan Petroleum Exploration Co.	584.62	16.05
Fuyo Petroleum Development Co.	367.67	10.10
Idemitsu Kosan Co.	173.10	4.75
Sumitomo Petroleum Development Co.	118.50	3.25
Mitsui Oil Exploration Co.	118.50	3.25
Overseas Petroleum Corp.	78.50	2.16
Central Energy Development Co.	78.50	2.16
Toyo Oil Development Corp.	78.50	2.16
Mitsubishi Petroleum Development Co.	78.50	2.16
World Energy Development Co.	78.50	2.16
	<u>3,640.89</u>	<u>100.00</u>

CSO: 4120/211

SCIENCE AND TECHNOLOGY

JAPAN COMPUTER FIRM TO PRODUCE SOFTWARE IN PRC

OW231407 Tokyo NIHON KEIZAI SHIMBUN in Japanese 22 Mar 82 morning edition p 8

[Excerpts] Japan Computer Engineering (JCE), a Tokyo-based, medium-standing software firm (President Sachio Ishida and capitalized at 72 million yen), has signed a business tieup agreement with China Computer Service Corporation under which the Chinese firm will produce software for JCE computers on a commission basis. As an initial step, the production of a "new quake-proof design program" will begin in early April. JCE will be the first Japanese firm to produce software in China on a commission basis, and the tieup will draw the attention of Japanese and foreign computer makers.

With the new business tieup, JCE seeks to "clear the backlog in software production created by a shortage of technicians and receive more computer orders from domestic and other firms." China, on the other hand, hopes to learn Japan's software technology and earn more foreign currency. These are the main reasons the two sides have decided on the tieup agreement.

According to the basic agreement--recently entered into by the two sides--JCE will each year select several items from the software orders it receives which it thinks the Chinese firm can fill. JCE will prepare the basic design for the selected items and have the Chinese firm do the rest of the work. The Chinese firm will complete the software items by mobilizing technicians in Beijing and elsewhere and deliver the finished software to JCE, which in turn will pay the "wages." In the near future, JCE plans to commission the Chinese firm to undertake the entire production process including design. By so doing, JCE believes China will become a "production base for Japanese software makers."

CSO: 4106/91

SCIENCE AND TECHNOLOGY

BRIEFS

CONSTRUCTION OF POWERPLANTS APPROVED--Tokyo 26 March KYODO--A government advisory panel on power generation Friday approved construction of 11 hydro-electric power plants, three thermal power stations and one nuclear power plant, with a combined capacity of 4.28 million kilowatts. This brings the total capacity of new power plants approved so far this fiscal year to 7.75 million kilowatts or 70.5 percent of the government target of 11 million kilowatts for the year, which ends 31 March. The nuclear power plant which obtained the go-ahead Friday will be built at Kyowa-tomari in Hokkaido, northern Japan. It will be the first nuclear station in Hokkaido, and the second sanctioned this year. Officials said that the panel plans to approve construction of three more nuclear stations in Kyushu and Shikoku with a total capacity of 3,250,000 kilowatts later this year. Japan's power generation projects were seriously hampered in 1979 following the accident involving the nuclear power plant at the Three Mile Island in the United States in March that year. The government had only a fourth of its new power projects get through in fiscal 1979. But the situation improved in fiscal 1980, when the comparable ratio rose to 92.6 percent as three nuclear power plants were given the go-ahead. [Text] [OW260723 Tokyo KYODO in English 1544 GMT 26 Mar 82]

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April 22, 1982